AMATEUR SATELLITE REPORT

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AMSAT® NA *Newsletter for the Amateur Radio Space Program*

Amateur Satellite Report is endorsed by the American Radio Relay League as the special interest Newsletter serving the Amateur Radio Satellite Community

Sun Angles Force Reduction In AO-10 Operating Times

Because of seasonal changes in the sun angle relative to AO-10's solar panels, spacecraft controllers have announced a new operating schedule. Effective 00:00 UTC, July 27, AO-10 is available from MA 40 through 220. The lengthening of perigee eclipses, from about 42 minutes on August 17 to nearly an hour by mid-September also has required the rollback in operating time.

DB2OS has supplied the following estimates of sun angle and eclipse timing.

1987 Date	Solar-Illum.		Eclipse Data		
Mondays	SA	ILL%	MA in	MA out	Dur Min.
1987 Jul 27	−27	89	4	18	36
1987 Aug 3	−33	83	6	19	37
1987 Aug 10	−40	76	7	21	39
1987 Aug 17	−47	68	8	23	42
1987 Aug 24	−54	59	10	26	44
1987 Aug 31	−60	50	12	29	47
1987 Sep 7	−67	39	14	32	51

SA = Sun Angle ILL = Illumination

It is quite apparent that by late September the IHU will again be powered down due to the anticipated low battery charge. This may not be all bad since when the IHU is again powered up, the random arrangement of the registers may command the high gain antennas on line. It has been determined by the command team that AO-10 has been operating on the 70 cm and 2 meter monopole antennas for the last several months. This accounts, they say, for the relative insensitivity at apogee. If the high gain arrays are by chance switched back on line, that will increase throughput by several dB per link depending on where in the orbit you make the measurement.

More Details On RS-10/11 Telemetry, Antennas Provided

Additional information on the RS-10/11 telemetry suite has been provided by UA3CR via G3IOR. According to these sources, channels 2 and 3 (see *ASR* #154) indicate the receiver attenuation employed by the transponder receiver in use. The table previously supplied indicated (apparently incorrectly) that channel 2 referred to the 2 meter receiver while channel 3 referred to the 15 meter receiver. The revised information suggests that channels 2 and 3 should be interpreted together. Thus, attenuation values can be 0, -10, -20 and -30 dB as indicated by channels 2 and 3 together.

When a command station is accessing the system, the telemetry format is modified slightly. The modification takes the form of an extra dot or dash on the first character of the channel indicator character. For example, when the command station is accessing the system via the 15 meter uplink, an extra dot is added so the channel designator IS becomes SS, IR becomes SR, ID becomes SD, etc. On the other hand, when the command station is accessing the system via the 2 meter uplink, a dash is added to the first character of the channel identifier. Thus, IS becomes DS, IR becomes DR, ID becomes DD, etc. The high speed telemetry observed on the beacon frequencies is said to be ASCII-coded telemetry used by the ground command station. Neither the high-speed ASCII telemetry nor the modified character format has been heard outside of Europe because (presumably) the only command station is in the Moscow vicinity.

The antennas used by RS-10/11 are all dipoles and are linearly polarized. The 2 meter dipoles are separate but the 15 and 10 meter dipoles are combined. The power source for the transponders is shared with the primary payload COSMOS 1861. The primary payload is a navigation satellite, part of the Russian Cicada system, which has a downlink at 150 MHz. This downlink has severely interfered

with the 2 meter Mode A uplink of RS-10/11. This fact may limit the use of Mode A in the future. Both RS-10 and RS-11 can be activated simultaneously if desired although they will not normally be commanded on concurrently.

AMSAT Director Elections

(See Ballot card enclosed.)

The following statements have been supplied by the candidates:

John Browning, W6SP — John, a native of Terra Alta, West Virginia, now lives in Rancho Palos Verdes, CA. He was first licensed in 1948 as W8DDF. Callsigns formerly held include W6ASA, G5ASA, DL5DD, KA2DD, OX5ND, ON8SR and S79S. John has served as an AMSAT Director and as Chairman of the Board of Directors for the last 8 yrs. He is past Chairman of Project OSCAR, past Pres. of the S. California DX Club and former V.P. of the N. California DX Club. He is a life member of AMSAT and ARRL. He received a B.S. in Electrical Engineering in 1949 and M.S. in Industrial Management in 1961. He retired from the U.S. Air Force as a Colonel in 1982. His military experience included service as a bomber pilot, jet fighter pilot, avionics officer and space program director. John is President of Altaspace, a firm which provides satellite and communication system planning services for industry. He is a Regional V.P. of the Armed Forces Communications and Electronics Association.

John Champa, K8OCL — John presently serves as an Alternate Director to the Board, Exec. V.P., Publisher of the *AMSAT Management Letter (AML)*, primary Net Control for the AMSAT Detroit Net and member of the 1987 Space Symposium Committee. John's academic background consists of a Masters degree in Engineering and a Doctorate in Business Administration. He also holds a certification as an RF Telecommunications Engineer, First Class with Master Endorsement. John is employed as a corporate Engineering Manager with UNISYS. He would bring to the Board his extensive experience in a wide range of technical subjects and a practical business management perspective coupled with his over 13 years as a dedicated AMSAT volunteer. This combination will contribute to the leadership AMSAT needs for our entry into the exciting Phase 4 era and beyond.

John Henry, VE2VQ — John, LM 79, is presently a member of the AMSAT Board of Directors. He has been active on satellites since 1974. John was involved with the Dept. of Communications test on OSCARs 6 & 7 of doppler position locating that later led to the SARSAT satellites. He proposed a geostational amateur satellite project known as SYNCART in 1978/79. The new proposed Phase 4 geostationary project is of great personal interest. John is a P. Engineer/Supervisor employed by Telesat Canada, the domestic satellite carrier and operator of the ANIK satellites. "I would like to use my business, management and technical knowledge to better AMSAT and its members. I would be pleased to serve again on the AMSAT Board of Directors."

Jan King, W3GEY — Jan who is member #2 has been with the organization since its inception and is the only remaining original member of the Board of Directors. He was the first Executive V.P. and was Project Manager for AMSAT OSCARs 5, 6, 7, Phase 3A, Phase 3B and Phase 3C. In addition, he coordinated the launches of AMSAT-OSCARs 5, 6, 7, 8 and 9 with NASA. Jan has participated in the development of flight hardware for all AMSAT spacecraft launched to date. In 1980 he was the recipient of the John T. Chambers award for activities related to the AMSAT-OSCAR program. Currently he is actively involved in the technical study of the Phase 4 concept. Jan is employed by SKYLINK having previously worked for NASA/Goddard Space Flight Center. If elected he will try to provide a historical perspective toward those issues which will face AMSAT and will assist in setting new technical goals for the organization that are in balance with user needs and the objectives of the organizations as stated in our Articles of Incorporation.

Andy MacAllister, WA5ZIB — Andy has been an extremely active AMSAT supporter and Life Member since OSCAR 7. He holds the positions of AMSAT Awards Manager, editor of the *AMSAT Management Letter* and alternate to the Board of Directors. In addition to operation on every satellite mode, Andy devotes time to author the HAMSATs column in *73 Magazine* and to publish *OSCAR Notes*, a newsletter for S. Texas satellite enthusiasts. He also wrote "Starting Out," the beginner's column in the *AMSAT Satellite Journal* and has been published in *ASR* and *ORBIT* magazine. Licensed since high school, he holds an Amateur Extra Class ticket and is an ARRL life member. By profession, a hostile-environment electronics design engineer, Andy finds amateur satellite activity the most challenging and fascinating aspect of amateur radio. He has made several thousand satellite contacts, given "how to" talks to local groups and was recognized at the 1985 AMSAT Awards Banquet for his efforts informing amateurs about the ham radio satellites. "As a member of the Board of Directors, I will focus on expanding AMSAT membership and promoting the availability of amateur satellite information for present and future enthusiasts. I would like to see AMSAT continue with dynamic projects like the Phase 4 geostationary satellite program, stay in the forefront of amateur communications and emphasize growth through education and action."

Bob McGwier, N4HY — Bob was licensed in 1965 and earned his extra in 1972. He graduated from Auburn University with a B.S. in Applied Mathematics and earned a Doctorate in Applied Mathematics from Brown University. He is married to Shann Waite, WB4NAC and has two harmonics and one on the way. He is employed by I.D.A. Communications Research Division in Princeton, NJ. Bob is a former AMSAT Software Exchange manager and the author of Quiktrak and Maptrak programs and the new super IBM program. He is a member of the Phase 4 engineering study team, co-chairman with W3IWI of the AMSAT/TAPR digital signal processing project and a

member of the editorial board of the *AMSAT Technical Journal*. During the time he was a professor of mathematics at Auburn, he was assistant AMSAT Area Coordinator for Alabama 1984-1986. He was net control for the AMSAT 15/20 meter nets during 1982-1984. Current research/programming projects for AMSAT include: theoretical work on novel techniques for attitude control in low cost three axis stabilized geostationary spacecraft (with W5DID), applications of advanced digital signal processing hardware for optimal spectral efficiency and low bit error rates in power limited systems such as spacecraft (primarily with W3IWI and KA9Q), new techniques for minimization of the error residual in a new iterative technique for orbital element determination in support of Phase 3C and in addition the use of spread spectrum ranging techniques in support of Phase 4 (with KA9Q). Opitmal final orbit burn search code is finished for Phase 3C and 4. Bob is supporting the coding effort in advanced protocols for packet radio (cheerleader for KA9Q and port of net to Z80 (NNC) systems. Appointed by the ARRL ad hoc digital committee to the team to define AX25L2 version 3, and to design a simple scheme to monitor and collect data on spectrum utilization and to study different signalling schemes for HF packet work at higher bit rates than 300.

Bill Tynan, W3XO — Bill was one of the founding members of AMSAT, holding Life Member –10. Over the years he has served on the Board of Directors, as Publicity Chairman, as V.P. for Operations and most recently as V.P. for Manned Projects. In this capacity, he coordinated the writing of the Joint AMSAT/ARRL proposals for Owen Garriott's and Tony England's amateur operations from the Shuttle as well as one for participation in the next Shuttle mission in which a licensed amateur is to be among the crew. He is currently involved in the preparation of a similar proposal for Amateur Radio participation on the Space Station. In addition to AMSAT activities, Bill has been a contributing editor to *QST* responsible for conducting the monthly column "The World Above 50 MHz." In 1970 as PJ9AF he and W1FJJ won First Place in the World in the Multi-operator Single transmitter Category in the CQ world-wide DX contest. He is currently a member of QCWA and the Central States VHF Society. He assumed the post of Historian for that organization two years ago. Professionally Bill has been employed at the Johns Hopkins University APL since 1951. He is currently a member of the organization's Senior Staff. Bill first licensed in 1945 as W3KMV holds an Extra Class license. He is 60 years of age and is considering retirement from APL in order to devote more time to Amateur Radio, particularly AMSAT. He promises to bring to the Board his years of professional and amateur experience in related technical disciplines as well as his background in management and fiscal matters.

Surrey Meeting Attracts Enthusiasts From Around the Globe

Nearly 200 satellite enthusiasts from across the world descended on the pleasant hill top campus of the University of Surrey, Guildford, England July 18 and 19 to attend the second Satellite Colloquium. The event was co-sponsored by AMSAT-UK and the University of Surrey. Speakers presented papers on UoSAT satellites, AO-10 condition report, Keplerian elements and accuracy requirements, RS-10/11, Phase 3C, Phase 3D, Phase 4, modems, simple manual tracking methods and more.

Awards were received by G3AAJ, DB2OS, DK1YQ, ZL1AOX and VK5AGR. G3AAJ received his award for his diplomatic efforts while DB2OS, DK1YQ, ZL1AOX and VK5AGR were awarded plaques for their efforts in recovering AO-10 after its IHU difficulties and collaborating on a plan to obtain further use from the bird. WØPN and VE1SAT were awarded identical plaques last year for their part in the AO-10 recovery effort.

Attendees included representatives from the South Pacific, South America, North America and Africa as well as the strong European contingent. About the only disappointment was the unexplained absence of featured speaker Leonid Labutin, UA3CR, whose last minute no-show replicated last year's circumstance.

An informal appraisal of attendee reaction was uniformly excellent; all felt the event was extremely well-organized and informative. There was no lack of enthusiasm on virtually every subject presented. A spirited debate on Sunday afternoon regarding the merits of Phase 3D compared to Phase 4 capped the weekend and gave the attendees a lot to think about on their trek homeward.

Saint Paul Island To Appear on RS-10/11

A satellite DX-pedition to Saint Paul Island off the east coast of Canada is planned for the second week in August according to Don, VE1AOE. He, together with VE1BZB and VE1BIZ will be on the fabled DX QTH beginning August 10 and will operate for 3 to 4 days. Don says they will operate primarily RS-10 and 11 but may give FO-12 a shot too. Saint Paul Island is located at 47.1 N, 60.1 W and is a 3 hour boat ride from Cape Britain, Nova Scotia, the last stretch of which must be accomplished by rowboat for lack of an acceptable harbor or mooring. All three DXers are from Truro, Nova Scotia, 60 miles north of Halifax. Watch for their special callsign, CY1SPI, and QSL to VE1AOE.

W4BIW Wins Major Honor

Byron Lindsey, W4BIW, of Decatur, Georgia, has been awarded the 1987 Amateur Radio Ambassador Award. He was recognized for his outstanding work presenting Amateur Radio in a very favorable light in the public eye. He has been a one man diplomatic corps in the Southeast carrying Amateur Radio's and especially AMSAT's message far afield. Byron is AMSAT's newly appointed Regional Coordinator for the Southeast.

The award was presented by AEA (Advanced Electronic Applications) President Mike Lamb, N7ML. A $1,000 check accompanied the citation. The award was made at the ARRL National Convention Banquet in Atlanta, GA, on Saturday night, July 11. Many AMSAT members were among the hundreds who attended the banquet. Banquet Master of Ceremonies was Roy Neal, K6DUE.

AMSAT congratulates Byron on his being cited for this signal award, one of the most prestigious in Amateur Radio.

Central States VHF Society Donation

The Central States VHF Society presented a check to AMSAT for $400 at its annual conference held in Arlington, TX, on 23-26 July. This donation is earmarked for technical activities. The Central States VHF Society continues to be a strong supporter of the Amateur Satellite Program as demonstrated by its regular annual contributions and the fact it has presented its prestigious Chambers Award for technical achievement to several prominent AMSAT members.

This year's donation was accepted on behalf of AMSAT by Keith Pugh, W5IU. Also attending this year's conference were AMSAT members W3IWI, WØCY, WA5ZIB and many others.

Many thanks to Central States VHF Society for their generous support!

New Soviet Birds Win Praise

Many users are finding the new RS-10 and 11 birds fun to use and very sensitive. For example, over the July 4th holiday weekend, W2RS worked W1NU on Mode A while W2RS was using a 2 meter HT with a rubber duck antenna and only 100 milliwatts according to KA1M!

Mode K (15 meters up, 10 meters down) has proven popular too. The signals on 10 meters are sufficiently strong that a simple antenna is all that is required. Although a preamp is normally recommended, beginners will have no problem hearing RS-10 and RS-11's downlink on 10 meters.

No operating schedule has yet been announced for these birds although in the past Wednesdays, UTC, have been off days for the RS's. Until a schedule is announced, however, it is presumed the new Russian birds can be worked when/as available.

Short Bursts

- The Sixth ARRL Amateur Radio Networking Conference will be held August 29 from 9 AM to 6 PM at the TRW facility, Redondo Beach, California. The meeting will be hosted by the TRW Amateur Radio Club and the Southern California Digital Communications Council. For further information, please contact Wally Lindstruth at 805-966-6424.
- Three more Cosmonauts were launched by the Soviet Union early Wednesday, July 22. Two Soviet citizens and a Syrian were aboard according to news services. The launch, which had been anticipated, was expected to rendezvous with the Mir Space Station within a day of liftoff. Mir's orbit had been adjusted slightly in recent days to ease the rendezvous. Two other Cosmonauts are aboard Mir. The docking should have been easily visible by ground observers.
- WB6GFJ has found a couple of models of the Ariane 4 launcher in his local hobby store. He says they would seem to be excellent props for OSCAR talks, especially those which focus on future launches such as Phase 3C next Spring. One model is manufactured by a French company while the other is Revell model 4762. The Revell model has a fairing that opens to show the "cargo".

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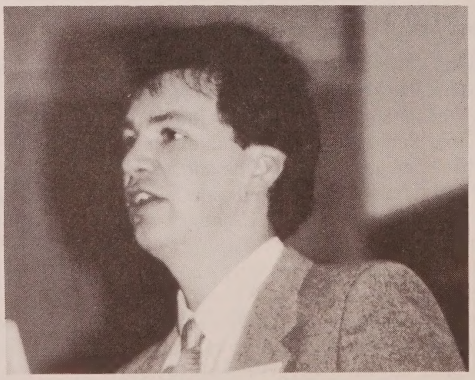

Jeff Ward, GØK8KA, session chairperson at the AMSAT UK/University of Surrey Colloquium at the Surrey campus, Guildford, England July 18.

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